MOTOROLA MAXAR®•MAXAR-80®•MOXY®

Speaker/Amplifier

Models TSN1001A, TSN1002A, TSN1003A
Option B549

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Instruction Manual

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SPEAKER/AMPLIFIER

MODELS TSN1001A, TSN1002A
AND TSN1003A

1. DESCRIPTION

1.1 The speaker/amplifier consists of a six-watt integrated circuit amplifier and a 2.0 ohm speaker enclosed in a rugged weather-resistant housing. The housing is designed to be mounted either inside or outside of a school bus, truck, emergency van or other similar vehicle. The TSN1001A Speaker/Amplifier is shadow bronze and used with the MOXY radio; the TSN1002A Speaker/Amplifier is shadow white and used with the MAXAR radio; the TSN1003A Speaker/Amplifier is shadow plum and used with the Maxar-80 radio. Each radio is capable of driving up to four speaker/amplifiers.

1.2 The speaker/amplifier may be used to remote the received audio to the rear of the vehicle or outside of the vehicle as shown in Figure 3. The internal radio speaker still functions to provide audio to the operator. The speaker amplifier may also be used in conjunction with the public address option for the MAXAR, MAXAR-80, or MOXY radio as shown in Figure 4. Each speaker is supplied with a 15-foot cable.

1.3 To facilitate connection of multiple wires to single pinouts from the radio, a 4-pin cable extender and 6-pin ground extender are supplied with each speaker. Their use is illustrated in Figures 3 and 4. The MOXY radio does not normally provide switched A+ at the rear connector. When the speaker option or public address option is ordered with a MOXY radio, the radio must be modified by the addition of a wire to provide switched A+ at J601-7 to power the speaker(s).

1.4 The speaker/amplifier includes a trunnion bracket, hanger bracket, and wall mount bracket, which permits the speaker to be mounted in a variety of ways. Refer to Details A and B of Figure 1. The trunnion bracket provides a large variety of permanent mountings (dashboard and accessible firewall areas) for the speaker while permitting it to be tilted or angled for best results. The hanger bracket (already attached to the speaker) by itself permits temporary mounting on projections such as automobile windows, etc. In this case, the trunnion bracket must be removed. The wall mount bracket can be used for permanent mountings if the trunnion bracket it too large to fit in some inaccessible areas. In this case, the trunnion bracket is removed and the speaker is attached to the wall mount bracket by the hanger bracket. Security screws are included for optional use in place of wing screws.

1.5 When the speaker is to be mounted external to the vehicle, it is recommended that it be mounted under the engine hood near the front grill. The location should be selected to provide best audio projection while affording maximum protection from the weather and environmental elements.

2. INSTALLATION

2.1 TOOLS REQUIRED FOR INSTALLATION

Center Punch
Hammer
Drill (1/4'' Chuck)
#22 Twist Drill (0.157'' for self-tapping screws)
#38 Twist Drill (0.101'' for self-tapping screws)
Nut Driver (1/4'')
Nut Driver (5/16'')

2.2 TRUNNION BRACKET INSTALLATION PROCEDURE (Refer to Detail A of Figure 1.)

Step 1. Remove the trunnion bracket by loosening the two wing screws.

Step 2. Remove the three paper retainers and screws from the trunnion bracket.

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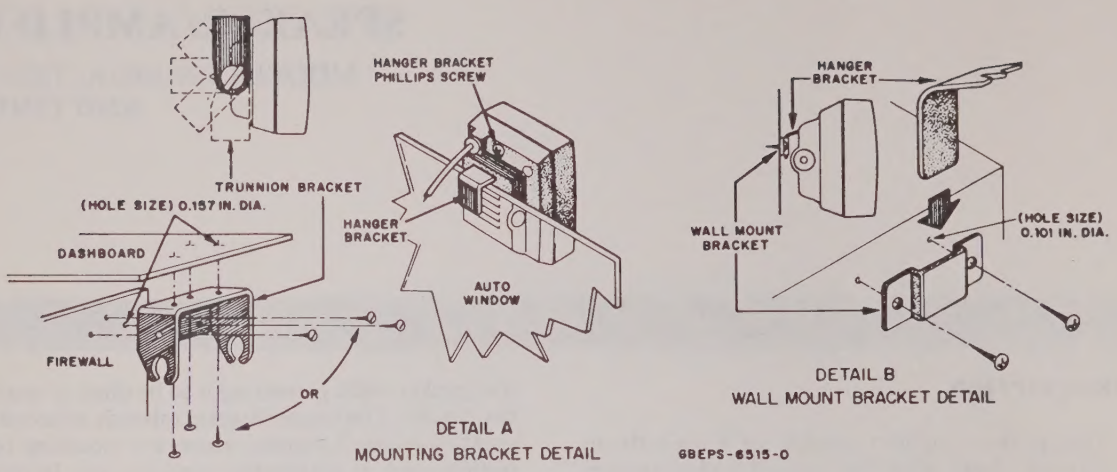


Figure 1. Physical Installation Details

Step 3. Remove the wall mount bracket from its taped position on the hanger bracket (retain for future use).

Step 4. Using the trunnion bracket as a template, mark the location of the three desired mounting holes.

Step 5. Centerpunch and drill a 0.157'' diameter hole at each location.

Step 6. Mount the trunnion bracket using the supplied screws.

Step 7. Remount the speaker into the trunnion bracket and retighten the two wing-screws.

2.3 WALL MOUNT BRACKET INSTALLATION PROCEDURE (Refer to Detail B of Figure 1.)

Step 1. Remove the wall mount bracket from its taped position on the hanger bracket.

Step 2. Remove the trunnion bracket and trunnion wing-screws (retain for future use).

Step 3. Remove the two paper retainers and screws from the wall mount bracket.

Step 4. Determine the location for installation.

Step 5. Using the bracket as a template, mark the location for the screws.

Step 6. Centerpunch and drill a 0.101'' diameter hole at both locations.

Step 7. Mount the wall mount bracket to the surface with the supplied screws.

Step 8. Firmly seat the hanger bracket (attached to the speaker) in the wall mount bracket.

2.4 DUAL BRACKET INSTALLATION

In some installations, such as school buses, where the speaker may be subject to excess strain or abuse it may be desirable to use both the trunnion mounting bracket and the wall mount bracket. In this case follow the procedures in both 2.2 and 2.3 but use the template in Figure 2 to locate the hole centers.

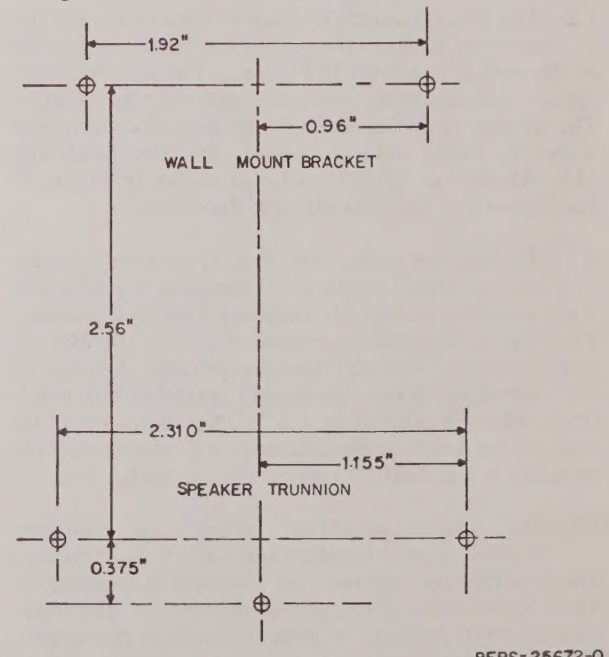


Figure 2. Dual Trunnion and Wall Mount Template

2.5 ELECTRICAL CONNECTIONS

Install the radio following the preinstallation and installation procedures described in the basic radio manual. Then use the following procedure to install the extension speaker.

NOTE

For Moxy radios, the TKN6990A must be added to the radio. The connector pin on this cable is inserted in P601 (P901 for UHF Moxy) at location 7. The red-white wire is then soldered to a hole in the large SW A+ pad on the radio main board near the volume control and the voltage regulator.

2.5.1 Single Extension Speaker
(Refer to Figure 3)

2.5.1.1 Ground Connection

Step 1. Strip about 1/2 inch of insulation from a convenient point near the radio on the radio set black ground lead that is connected to P601-6 (P601-B on MAXAR and MOXY 30/25 watt UHF radios and all MAXAR-80 radios).

Step 2. Tin the exposed ground lead conductor.

Step 3. Wrap the tinned end of the pigtail lead from the TKN6982A Ground Extender around the exposed ground lead conductor. Solder the connection.

Step 4. Wrap the connection with a good quality electrical tape to support the ground extender lead and protect the connection from moisture.

Step 5. Insert the male pin from the black speaker wire into any location on the ground extender plug.

Step 6. ("Private Line" or "Digital Private-Line" mobile radios only.) Insert the pin in the ground lead from the microphone hang-up box into any location on the ground extender plug.

Step 7. Mate the ground extender plug with its receptacle.

2.5.1.2 Input Connection

Step 1. Remove from radio connector P601 the pin at position 12 (connected to the jumper between 9 and 12). Insert this pin in any position on the TKN6981A Cable Extender plug.

Step 2. Insert the male pin on the wire from the TKN6981A Cable Extender receptacle in P601 at position 12 (from which the jumper pin was removed in Step 1.)

Step 3. Insert the male pin on the blue wire from the speaker in any position on the TKN6981A Cable Extender plug. The shield for this wire is not terminated at the extender plug.

Step 4. Mate the cable extender plug with its receptacle.

2.5.1.3 Power Connection

Step 1. Insert the male pin on the red wire from the speaker in P601 position 7.

Step 2. Dress the speaker cable along the radio cable and secure the two together using several tie-wraps. This will provide strain relief for the speaker cable.

Step 3. Mate P601 with receptacle J601 on the radio.

NOTE

If alternator whine is heard at the speaker the power and ground connections for the radio should be made directly to the battery rather than the ignition switch or other point. If this does not eliminate the problem, consult your Motorola dealer concerning whine filters and noise suppression kits.

2.5.2 Multiple Extension Speakers

Up to four speaker/amplifiers can be used with the Maxar or Moxy radio. If more than one is to be employed as an extension speaker follow the procedure above but use a second cable extender to distribute power from P601-7 in the same manner as shown in Figure 2 for receiver audio out from P601-12. One cable extension is supplied with each speaker/amplifier.

2.5.3 Public Address Option

Up to four speaker/amplifiers can be used with the Maxar or Moxy radio. When used with a radio equipped with the PA Option, these speakers can be used in any combination of in-vehicle PA, outside PA, and radio extension speaker. When installing the speaker/amplifiers use the techniques described in paragraph 2.5.1. Figure 4 shows a typical example of a PA installation. If more than one speaker is connected to the same radio output a TKN6981A Cable Extender is used as shown for internal PA. If a single speaker is connected to a radio output the pin from the blue lead for that speaker is inserted in radio connector P601 at the applicable location as shown for external PA. One TKN6981A Cable Extension is supplied with each speaker.

3. ADJUSTMENT

Step 1. Adjust the radio as described in the radio instruction manual.

Step 2. Set up conditions to provide a signal to the speaker (received audio message for extension speakers, or PA message with PA mode selected for public address speakers).

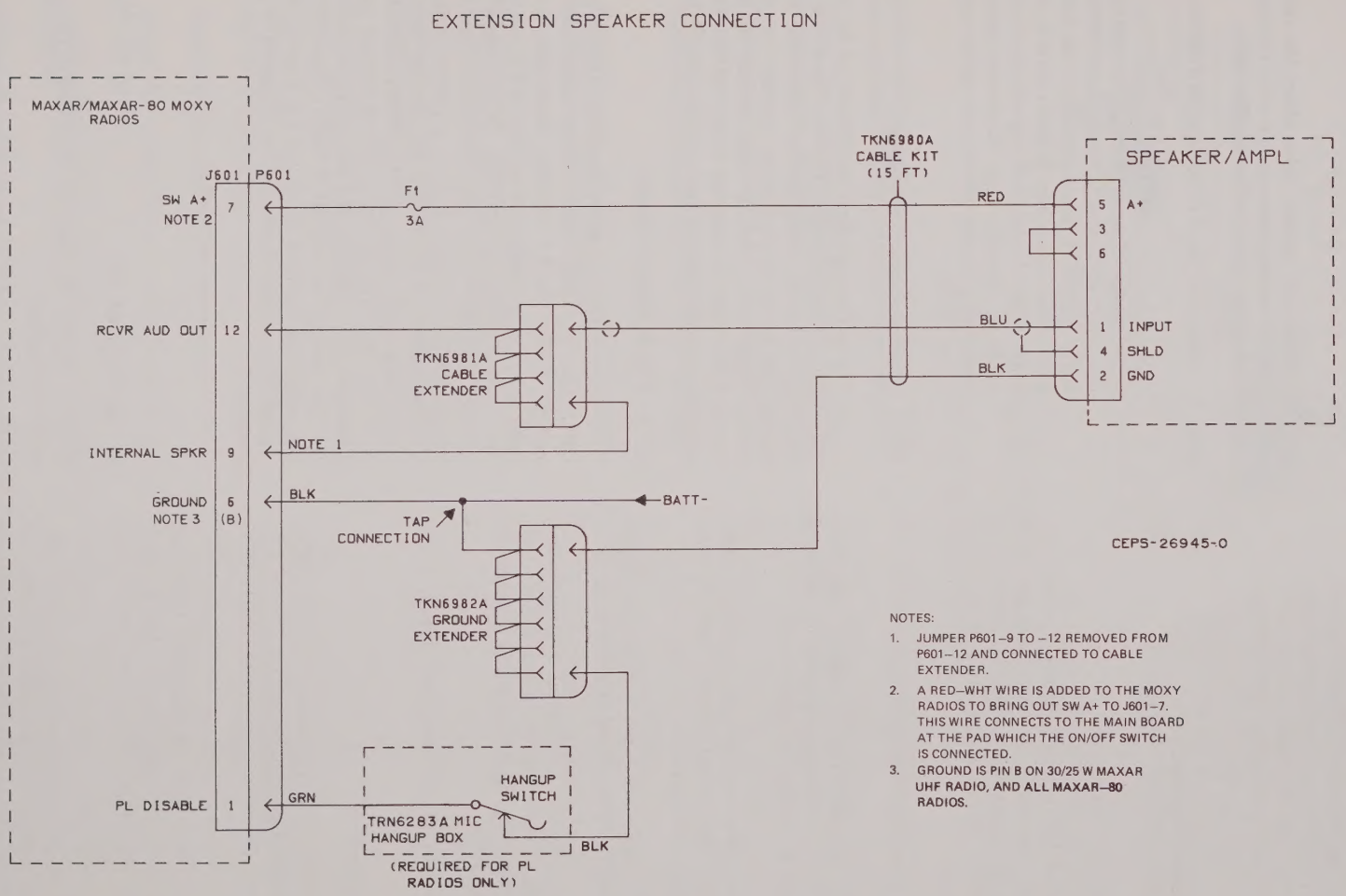


Figure 3. Typical Speaker/Amplifier Connections used as an Extension Speaker

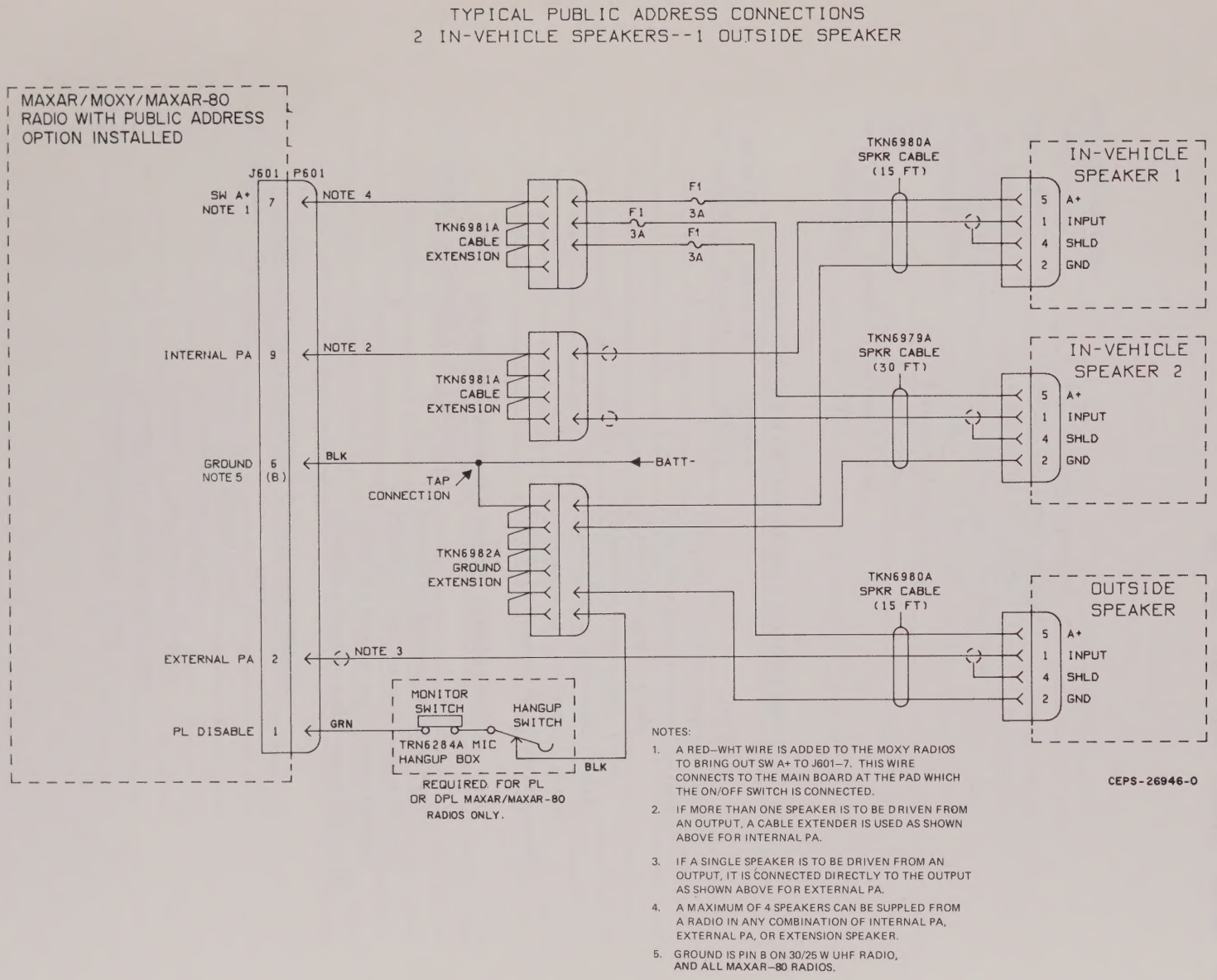


Figure 4. Typical Speaker/Amplifier Connections for Public Address

Step 3. Adjust the speaker/amplifier volume control (on speaker circuit board) for a convenient listening level clearly heard throughout the vehicle. In public address systems, make sure that this level does not cause acoustic feedback howl when the microphone is held near the operator's mouth.

SPECIFICATIONS

Rated Voltage	+ 13.8 V dc negative ground
Audio Input	2400 ohms with input level adjust
Input Sensitivity	0.5 volt input for full output
Audio Output to Speaker	6 Watts, with less than 10% distortion
Frequency Response	+ 1, -3 dB 300-3000 Hz
Speaker	5'' Permanent Magnet, 2 ohm
Cable	15 feet (4 conductor)
Battery Drain: Standby	less than 0.1 amp
Full Output	0.75 amp

B549 SPEAKER OPTION MODEL COMPLEMENT

B549-D MAXAR-80	B549—B MAXAR	B549—C MOXY	UNIT
	1		TSN1002A Speaker/Amplifier (Maxar)
		1	TSN1001A Speaker/Amplifier (Moxy)
1	1	1	TKN6980A Speaker Cable
		1	TKN6990A Switched A + Cable
1	1	1	TKN6981A Cable Extender (4-pin)
1	1	1	TKN6982A Ground Extender (6-pin)
1			TSN1003A Speaker/Amplifier (Maxar-80)

SPEAKER AMPLIFIER MODEL COMPLEMENT

TSN1003A	TSN1001A	TSN1002A	UNIT
1	1	1	TRN8389A Speaker Amplifier Board
	1		TSN6027A Speaker and Housing (Moxy)
		1	TSN6028A Speaker and Housing (Maxar)
1			TSN6029A Speaker and Housing (Maxar-80)

ADDITIONAL ACCESSORY CABLE ASSEMBLIES

TLN2009A	TLN2010A	UNIT
	1	TKN6979A Speaker Cable
1		TKN6980A Speaker Cable
1	1	TKN6981A Cable Extender (4-pin)
1	1	TKN6982A Ground Extender (6-pin)
1	1	TKN6990A Switched A + Cable

parts list

TRN8389A Speaker Amplifier Board — PL-5866-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: unless otherwise stated
C1	23-84665F01	10 + 100-10%; 25 V
C2	23-84665F03	100 + 100-10%; 25 V
C3	8-852471	.047 ± 10%; 100 V
C4	23-84665F06	220 + 150-10%; 25 V
C5	8-847099	0.1 ± 20%; 150 V
C6	21-82372C01	0.1 + 80-20%; 25 V
C7	23-84665F03	100 + 100-10%; 25 V
C8	21-82213E12	.01 ± 20%; 100 V
C9	21-83596E10	220 pF ± 20%; 500 V
C10	21-82187B20	.001 ± 10%; 100 V
C11	21-83596E10	200 pF ± 20%; 100 V
C12	21-82428B59	.01 + 80-20%; 200 V
		resistor, fixed: ± 5%; unless otherwise stated
R1	6-185B83	2.2k ± 10%; 1/8 W
R2	18-84944C04	var. 500
R3	6-124C17	47 ± 10%
R4	6-124A35	270
R5	6-124B55	2.7
R6	6-125B70	1; 1/2 W
R7	6-185B76	560 ± 10%; 1/8 W
		integrated circuit: (see note)
U1	51-84621K60	type M2160
		mechanical parts
	29-84706E05	TERMINAL, pin; 6 used
	30-824273	CONDUCTOR, shielded; 8" used
	37-132562	TUBING, heat-shrink; 0.38" used
	42-10217A02	TIE-WRAP; 2 used

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TKN6990A Switched A + Cable — PL-5833-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	1-80706D53	LEAD and CONTACT includes
	29-84706E06	TERMINAL, socket

TKN6981A 4-Pin Cable Extender — PL-5834-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15-84860K01	HOUSING, receptacle
	15-84861K01	HOUSING, plug
	29-84706E05	TERMINAL, pin
	29-84706E06	TERMINAL, socket; 4 used

TKN6982A 6-Pin Cable Extender — PL-5835-O

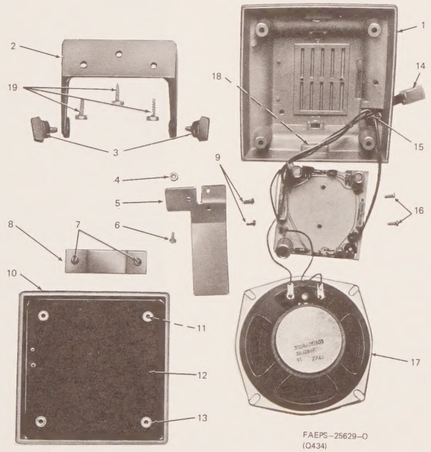
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15-84953L01	HOUSING, receptacle
	15-84954L01	HOUSING, plug
	29-84706E06	TERMINAL, socket; 6 used

TKN6980A Speaker Cable Kit — PL-5832-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15-84954L01	HOUSING, plug; 6-contact
	29-84706E05	TERMINAL, pin; 9 used
	30-824273	CONDUCTOR, shielded; 144" used
	42-10217A02	STRAP, tie; 12 used

TSN6027A/TSN6028A/TSN6029A Speaker and Housing Kit — PL-5830-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
1	1-80706D42	HOUSING ASSEMBLY, rear (TSN6027A) includes ref items #11, #13, and 15-84981B04, COVER, speaker; (shadow bronze)
	or1-80706D43	HOUSING ASSEMBLY, rear (TSN6028A) includes: ref items #11, #13, and 15-84981B03, COVER, speaker; (shadow pearl)
	or 1-80710D26	HOUSING ASSEMBLY, rear (TSN6029A) includes: ref items #11, #13 and 15-84981B08 COVER, speaker (shadow plum)
2	7-84568B01	BRACKET, trunnon (shadow bronze)
	or 7-84568B02	BRACKET, trunnion (shadow black)
3	3-84244C01	SCREW, wing; 10-32x3/8"; 2 used
4	2-131435	NUT, hex; 4-40x1/4x3/32"
5	7-84707L01	BRACKET, hanger
6	3-1943	SCREW, machine; 4-40x5/16"
7	3-3360	SCREW, tapping; 6-20x1/2"; 2 used
8	7-84708L01	BRACKET, wall mounting
9	3-2941	SCREW, machine 6-32x1/4"; 2 used
	13-84151C01	BEZEL, speaker front shadow pearl (TSN6028A)
10	13-84151C02	BEZEL, speaker; front; shadow bronze (TSN6027A)
	or 13-84151C04	BEZEL, speaker front; shadow plum (TSN6029A)
11	3-132436	SCREW, machine; 6-32x13/16"; 4 used
12	35-84709L01	GRILLE, cloth
13	42-10438A08	RING, retainer; 4 used
14	15-84954L01	HOUSING, plug; 6-contact
15	42-850861	RETAINER, cable
16	3-139047	SCREW, tapping; 4-40x5/16; 2 used
17	50-84561B03	SPEAKER, dynamic; 5"; 15 watt
18	33-82599D01	NAMEPLATE
19	3-136756	SCREW, tapping; 10-16x5/8";3 used
		non-referenced items
	3-84349K02	SCREW, security: 10-32x1/2"; 2 used
	4-139941	WASHER, security: 2 used
	66-84352K01	TOOL, security screw



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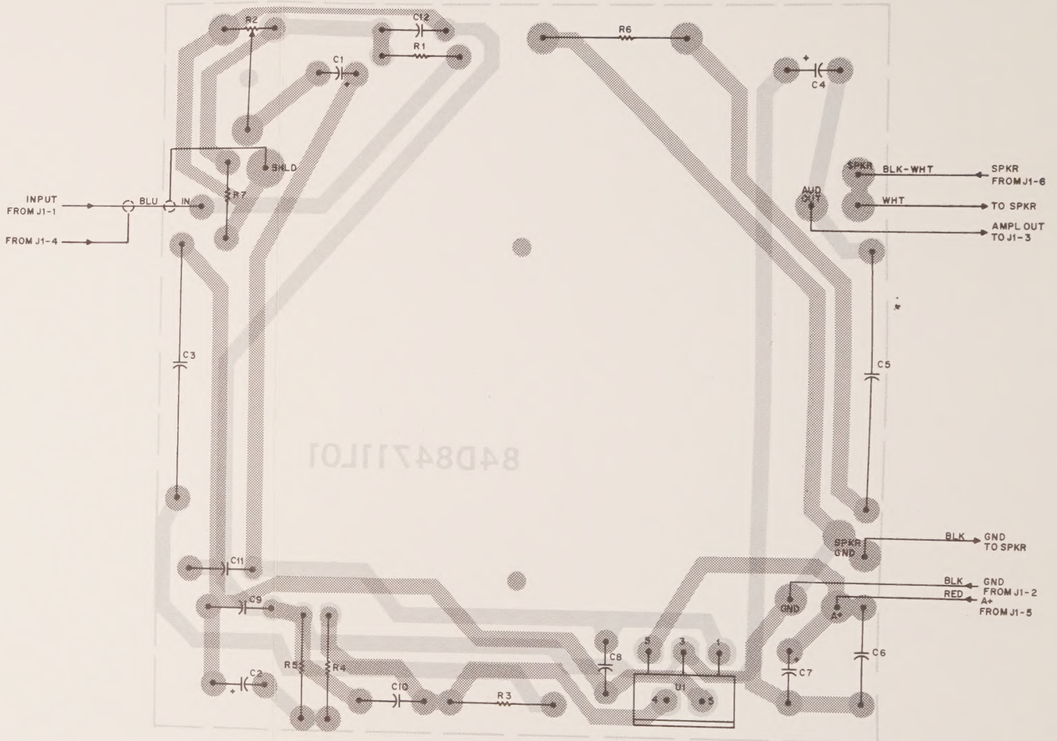


COMPONENT SIDE CEPS-26951-O
SOLDER SIDE CEPS-26952-O
CEPS-26953-O

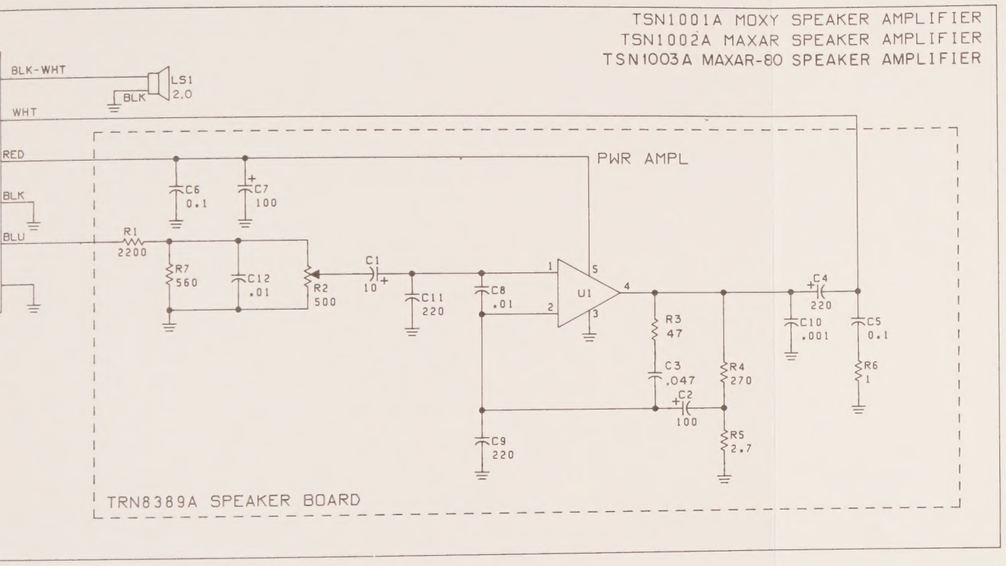
SHOWN FROM COMPONENT SIDE

MAXAR® •MAXAR-80® •MOXY® SPEAKER/AMPLIFIER

MODELS TSN1001A, TSN1002A, TSN1003A
OPTION B549

FUNCTION

The speaker/amplifier consists of a 6-watt integrated circuit amplifier and a 2.0 ohm speaker mounted in a rugged weather resistant housing. Up to four speaker/amplifiers can be driven from one radio. The TSN1001A is shadow bronze and used with the Moxy radio; the TSN1002A is shadow white and used in the Maxar radio. The TSN1003A is shadow plum and used with the Maxar-80 radio.



P1
04 10
05 20
06 30
IEWED FROM
WIRE SIDE

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   RESISTOR VALUES ARE IN OHMS
   CAPACITOR VALUES ARE IN MICROFARADS
2. JUMPER J1–3 TO J1–6 IS NORMALLY SUPPLIED AS PART OF CABLE KIT. JUMPER CAN BE REMOVED AND POWER AMPL USED TO DRIVE ANY 1.6 TO 4 OHM REMOTE SPEAKER.

CEPS-26944-O

PEPS-26950-O
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